

will be found to be accompanied by some structural difference that, when once correlated, will serve to determine what the storing habit of the species is.

Though all the species heretofore mentioned were interesting objects of study, all paled before the little blue and green *Augochlora humeralis* which was followed through all its stages.

The life history of that species, with figures illustrating also some of the matters hereinbefore referred to, will form a second part of this essay.

NEW SPECIES OF HETEROCERA FROM TROPICAL AMERICA.—I.

By WILLIAM SCHAUS.

SYNTOMIDÆ.

Pseudosphex noverca.

Head grayish. Collar black, fringed posteriorly with gray. Thorax black; a transverse gray line posteriorly. Abdomen black; a gray streak laterally at base; ventral valve fringed with white. Wings hyaline, the veins black. Primaries: costal margin broadly, inner margin narrowly on basal half, suffused with dark brown; fringe dark brown. Secondaries: the basal half of costa narrowly suffused with dark brown. Expanse, 27 mm.

Habitat: Castro, Parana.

Bombiliodes jamaicensis.

Palpi and head black. Collar and thorax black; collar and patagiæ with a crimson streak, mottled with white scales, and inwardly shaded with metallic blue scales. Abdomen crimson; a dorsal black band; the segments posteriorly black; underneath pale brown. Thorax below and legs black, the latter streaked with blue; tarsi circled with white. Wings transparent. Primaries: the margins black; the apex broadly black; a large black spot at end of cell touching costa, and a smaller spot about center of cell resting on costa, and not reaching the median vein. Secondaries: apex broadly, outer and inner margin narrowly black. Antennæ black, tips yellow. Expanse, 39 mm.

Habitat: Jamaica.

Bombiliodes xanthogastroides.

Antennæ black, streaked with white at apex. Head black; vertex dark blue. Collar black with two dark blue spots. Thorax black. Abdomen black basally, shaded with blue laterally; the last four segments orange; underneath the last three

orange, otherwise black. Thorax below and legs black. Wings transparent, the veins black. Primaries: margins narrowly black; a black streak at end of cell, a transparent streak at base of costa. Secondaries somewhat opalescent; the margins narrowly black, more broadly so between anal angle and vein 2. Expanse, 38 mm.

Habitat: Castro, Parana. Looks very much like *Gymnelia xanthogastra* Perty.

Mesothen albifrons.

Head black; frons white. Collar and thorax above black; patagiæ streaked with yellow; underneath yellow. Legs yellow; tarsi and joints black. Abdomen yellow; last three segments black. Wings hyaline, veins black. Primaries: some yellow hairs at base; margins black, thickened at inner angle; apex broadly black; discocellular slightly more heavily marked than veins. Secondaries: margins narrowly black; some yellow at base. Underneath costal margin and veins streaked with yellow; fringe terminally yellow at anal angle. Expanse, 25 mm.

Habitat: Colombia.

Cosmosoma flavita.

Head black. Collar yellow. Thorax yellow; two black spots anteriorly; patagiæ outwardly streaked with blue black. Legs black; fore coxæ yellow. Abdomen yellow; last two segments black. Wings hyaline, veins black; base of wings black; margins narrowly black, more widely so at apices, especially on primaries; base of costa with vitreous streak. Expanse, 38 mm.

Habitat: Colombia.

Eurota minerva.

Head black. Collar black; two large yellow spots. Thorax black; a yellow spot anteriorly on patagiæ. Abdomen black; lateral crimson spots on first three segments; a yellow spot on the fourth and fifth. Primaries black; a yellow streak at base; some crimson hairs at base of inner margin; median semitransparent white spots, two in cell, superposed, one below cell somewhat larger, and a much smaller spot below it; four similar spots beyond the cell between veins 3-7. Secondaries black; two whitish spots beyond the cell; the inner margin broadly crimson. Underneath the same. Hind wing with veins 2 and 4 from cell. Expanse, 27 mm.

Habitat: Castro, Parana.

Macrocneme nordina.

Antennæ black, tipped with white. Palpi black outwardly suffused with blue. Legs black; hind tarsi black; fore coxæ metallic green. Head black; frons and vertex blue. Collar black, irrorated with blue scales. Thorax black; two subdorsal metallic spots. Abdomen black; a broad lateral metallic green band, suffused with blue at base; underneath some metallic spots. Wings black; at base of primaries some metallic blue scales on inner margin. Underneath: wings black; on primaries some blue irrorations on costal margin and below cell; on secondaries some blue irrorations on costal margin, at base of cell, and inner margin. Expanse, 35 mm.

Habitat: Guadalajara, Mexico.

Macrocneme sura.

Palpi and legs black, suffused with metallic blue scales. Hind tarsi tipped with white. Head black; frons with two large white spots, and two smaller under antennæ. Collar black with two small blue and white spots. Thorax black; patagiæ with a small blue and white spot anteriorly. Abdomen metallic green above, black underneath; the ventral valve green and followed by two ventral rows of white spots. Primaries: a basal band, and the outer margin broadly black, otherwise shot with dull metallic blue green. Secondaries black. Underneath wings black, shot with dull green to beyond cell. Expanse, 35 mm.

Habitat: Petropolis, Brazil.

Æthria analis.

Antennæ black, petinated, and thickly tufted above on median third. Head, thorax, and legs black; some blue shadings on femoræ, collar, and patagiæ. Abdomen black; the last three segments orange red. Wings transparent, the veins black. Primaries: the margins black; the outer margin inwardly dentate; a broad black discocellular streak, touching costa; some violaceous hairs at base of inner margin. Secondaries: the outer margin broadly black. Expanse, 29 mm.

Habitat: Peru.

Argyroceides vespina.

Palpi yellow. Frons black, edged with yellow. Vertex black with a transverse yellow line, collar black edged with yellow. Thorax black; yellow lines posteriorly; the patagiæ edged with yellow. Legs pale brown; fore coxæ yellow. Abdomen black, spotted with yellow at base; four terminal transverse yellow lines. Wings yellowish hyaline; the veins pale brown; fringe black. Costa of primaries with a darker yellow hyaline streak. Expanse, 24 mm.

Habitat: Castro, Parana. Belongs to section with vein 6 below angle of cell on secondaries.

Diptilon aterea.

Head black; frons yellow. Collar and thorax black, the former, and patagiæ finely edged with yellow. Legs black; tarsi below yellow. Abdomen black; a yellow lateral streak on basal half; underneath yellow on basal half. Primaries yellowish hyaline; the margins black, widest at apex; median vein yellow, other veins black; a black discocellular streak; a hyaline streak on basal half of costa; base of subcostal vein yellow; fringe black. Secondaries yellow; the outer margin black; fringe yellow. Expanse, 23 mm.

Habitat: Casa Branca.

Ceramidia cuprea.

Palpi and head black; frons with metallic green spot; a white spot at base of antennæ. Collar black, irrorated with dark green. Thorax black; a bronze green spot anteriorly. Legs black; tarsi gray; fore coxæ whitish. Abdomen: first seg-

ment metallic green, otherwise metallic bronze with two dorsal black stripes; underneath first segment white, otherwise dull bronze color; a sublateral white spot on second segment. Primaries dark brown, becoming paler at apex; some green scales at base of costa. Secondaries brown; the costa broadly whitish; two hyaline streaks on inner area. Expanse, 33 mm.

Habitat: Coatepec, Mexico.

Marecidia, gen. nov.

Antennæ shortly pectinated; tips serrate. Palpi long, ascending. Hind tibia with a very large gland filled with long hairs above. Primaries long and narrow; vein 2 far removed from 3; 3, 4 and 5 from lower angle of cell; 6 from upper angle; 7-10 stalked; 7 remote from apex. Secondaries narrow; costal margin slightly convex; veins 3 and 4 from lower angle of cell; 5 from just above lower angle; 6 and 7 on short stalk.

Marecidia sanguipuncta.

Head black; frons and vertex irrorated with metallic green. Collar metallic green, edged with black. Thorax black, patagiæ streaked with bronze green. Legs black, shot with metallic green and blue; fore coxæ white; joint of hind tibia white. Abdomen above metallic green; a subdorsal black line, and transverse lines on segments anteriorly; underneath green, with a basal white patch. Primaries black; the median space below subcostal, and above inner margin shot with brilliant green-blue; a bright crimson spot at the base. Secondaries black; a roseate spot in cell; a whitish streak on inner area. Underneath primaries with the crimson spot smaller, secondaries with a crimson spot in cell. Expanse, 33 mm.

Habitat: St. Catharina, Brazil.

Eucereon marcata.

Palpi black; the end of second joint white. Head white; a black spot on vertex. Collar white with two black spots. Thorax white; a black central streak; the patagiæ outwardly black. Abdomen roseate; the basal segment brown; anus black; a short brown subdorsal streak; a lateral row of black spots; underneath buff, shaded with roseate. Primaries white, the markings black; inner margin: a basal irregular spot; at middle two upright streaks connected by a cross line; a small spot towards inner angle. Costal margin: basal, inner, and outer black patches hardly extending below cell, and formed of contiguous spots; the outer patch suffusing with a large irregular spot between veins 2 and 3, which reaches the outer margin above the angle; three small spots obliquely between veins 4-7; before apex two rows of spots, the inner one from vein 5 to costa, the outer row from vein 6 to costa; a terminal black spot above vein 4, and a smaller one below it; fringe white spotted with black at ends of veins. Secondaries white, the veins gray; a slight grayish shade at apex and anal angle, a terminal gray line; fringe partly white. Expanse, 33 mm.

Habitat: Paraguay. Allied to *E. quadricolor* Wlk.

Eucereon mathani.

Palpi, head and thorax brown; two small yellow tufts behind vertex. Body blackish brown above, yellow banded with brown underneath; the anal hairs yellow. Primaries brownish gray, with dark brown markings; a basal spot; an inner curved wavy band; a quadrate spot in the cell, followed by a transverse paler brown spot, and then a large spot partly in the cell and partly beyond, cut by the veins into six parts; an outer curved row of elongated spots; a subterminal row of smaller spots; fringe brown, tipped with gray above vein 3, below it buff tipped with white. Secondaries somewhat transparent on basal half, brownish gray; the outer half dark brown narrowing towards anal angle. Underneath brown. Primaries with a whitish discal spot, and a large white spot beyond the cell. Secondaries with the inner area whitish. Expanse, 33 mm.

Habitat: Balzapamba, Ecuador.

Eucereon trinita.

Palpi, head and thorax gray; a black spot on vertex; two on collar, one anteriorly on patagiae, which are also inwardly black. Abdomen roseate tipped with black; Underneath buff; a lateral black streak. Legs gray; midtarsi banded with black; fore coxae roseate. Primaries gray, markings black; two basal spots above submedian; a large spot below submedian; three antemedial spots followed by a larger spot in cell; six median spots, the upper three suffusing somewhat; an outer row, curved around end of cell, consisting of three large spots below costa, three shades close to cell, between veins 2-5, the shade between 2 and 3 followed by another spot; a large spot above submedian, and below submedian a long spot reaching inner angle; a terminal row of spots; fringe spotted with black. Secondaries black, grayish at base. Expanse, 25 mm.

Habitat: Trinidad.

Eucereon lerioides.

Head, thorax and wings as in *E. leria* Druce. The abdomen pale yellow, instead of roseate, the anal segment black. Expanse, 35 mm.

Habitat: Jalapa, Mexico.

Ctenucha mortia.

Head posteriorly, underneath, and basal half of palpi orange; head and palpi otherwise black. Thorax black, finely streaked with yellow. Abdomen blue black; anal hairs orange. Primaries black, the veins grayish; a large white spot beyond the cell from vein 4-7; fringe black, white at apex. Secondaries blue black; the fringe white. Underneath the veins on secondaries are also grayish. Expanse, 37 mm.

Habitat: Castro, Parana.

Hyaleucereon lugubris.

Head and thorax brown. Abdomen brownish black; some terminal transverse violaceous shades. Primaries uniform dull brown. Secondaries brownish black. Expanse, 40 mm.

Habitat: Colombia.

PSYCHIDÆ.

Oiketicus orizavæ.

Primaries smoky gray, almost black on inner margin; a blackish spot occupying outer half of cell, followed by a white oblique mark, less dentate than in *O. kirbyi*; the outer margin semi-transparent. Secondaries smoky gray, the inner margin broadly blackish; the outer margin from vein 2 to apex semi-transparent. Expanse, 39 mm.

Habitat: Orizava, Mexico.

Chalia vigasi.

Wings gray, semi-transparent, thinly scaled with darker hairs. Costal margin of primaries finely black, fringe darker gray. Expanse, 16 mm.

Habitat: Las Vigas, Mexico.

Chalia tristis.

Wings grayish brown, thickly scaled. Primaries 4 and 5 from a point, 7 from near upper angle of cell, 8 and 9 on short stalk from upper angle. 1b angled, anostomosing with 1c, to outer margin. Secondaries: veins 4 and 5 close together, 8 far diverging from 7. Expanse, 17 mm.

Habitat: Jalapa, Mexico.

COSSIDÆ.

Duomitus pyracmonides.

Head and collar brown. Thorax grayish white. Abdomen brown, whitish subdorsally. Primaries white with transverse dark brown strise; basal third of costa dark brown; from below cell from before vein 2 an irregular broad brown shade to outer margin below apex. Secondaries gray on inner margin, otherwise whitish thickly irrorated with grayish strise, especially in median space. Fringe white. Expanse, 54 mm.

Habitat: Orizaba, Mexico. Can be easily distinguished from *pyracmon* Cramer by the absence of the terminal dark spots.

Duomitus mathani.

♂ palpi, frons, thorax, and abdomen below brownish black, legs black; tarsi circled with white. Vertex yellowish. Collar black. Thorax white with a central dark brown line. Abdomen dorsally white, with a subdorsal black streak on last five segments; laterally blackish. Primaries white, markings dark brown; a large spot at base of inner margin; a broad space from near base of costal margin extending to one third from base; a small dark spot on costal margin at two thirds, preceded by four small spots and followed by three a little larger; from below cells before vein 2 to outer margin at vein 7, an irregular broad band, nearly straight to along vein 5 then ascending obliquely to vein 7; a row of small spots along inner margin and above vein 1b; a few spots beyond cell; terminal blackish spots at veins partly extending on to white fringe. Secondaries white; the inner margin broadly shaded with brown; a median broad brown shade, posteriorly curved between the veins, and terminating towards costa in diffuse strise; terminal dark points as on primaries.

♀ paler below, the legs tufts with whitish hairs. Vertex yellowish. Thorax pale yellowish, thickly mottled with black scales. Abdomen dorsally yellowish with a subdorsal dark streak. Primaries white, thickly irrorated with brown, and also with black on inner margin; the base yellowish; the markings not distinct, more like shadings of brown irrorated with white scales; the longitudinal band most distinct between veins 4 and 7; on costa a median black streak preceded and followed by small black spots; a brown spot below the next to last costal spot; terminal black spots on outer margin. Secondaries brown, somewhat irrorated with gray on outer margin and towards base below the cell; terminal dark spots on outer margin; a large dark spot on costal margin before apex. Expanse ♂, 100 mm.; ♀, 125 mm.

Habitat: Huambo, Peru.

Dumitus jamaicensis.

Primaries: basal third almost black on costa, shading to gray on inner margin; this space limited by a dark line not extending below the submedian; a median whitish space, wider on costa than on submedian, irrorated with darker scales and strice, but not thickly; below the submedian the inner margin is grayer; a velvety black discal point; outer space dull gray; an outer pale gray row of spots between the veins, and terminal pale gray shadings, especially about and above inner angle; all the terminal space slightly irrorated with darker strice; fringe buff, spotted with brown at tips of veins. Secondaries pale grayish brown; fringe with indistinct darker spots. Female paler, the outer space with the paler space more extended, reducing the darker gray to an irregular band beyond the discal streak; a subterminal darker gray band, interrupted by the veins. Expanse ♂, 48 mm.; ♀, 55 mm.

Habitat: Jamaica.

Costria, gen. nov.

Differs from *Cossula* Bailey, in having veins 9 and 10 on primaries from a point, and 6 and 7 on secondaries well apart.

Type of genus, *C. abnoba* Schaus. (P. Z. S. Lond., 1892, p. 327.)

Costria corita.

Body gray; a median dark brown band on thorax. Primaries light gray; transverse brownish strice; a median, velvety brown line from cell, obliquely to vein 1b, where it is thickest; before the apex an inwardly curved, semilunar dark brown streak; a terminal brown, wavy, thick line, interrupted by the veins; fringe basally brown, outwardly mottled with gray. Secondaries white, some terminal gray shadings interrupted between the veins; fringe basally grayish brown, outwardly white. On secondaries below a brown discal spot. Expanse, 39 mm.

Habitat: Colombia.

Costria maruga.

Head gray, posteriorly dark brown. Thorax olivaceous; patagiæ gray. Abdomen yellowish white. Primaries pale silvery white tinged with gray; Median space of costa finely dark gray; a large round velvety brown spot in the cell; a smaller one below the median vein, and a still smaller one below vein 1b; these spots obliquely approaching the base of inner margin, and preceded by three dark points a little above them; beyond the spots eight transverse wavy lines; the first three gray,

broken; the first two shaded with brown below the median vein; the third shaded with brown below vein 1c; the fourth not extended below vein 3, geminate towards costa, and yellow posteriorly; the fifth dark gray from below costa to vein 2; the sixth dark brown from costa to vein 3; the seventh dark brown shaded with gray above vein 3, below vein 3 yellow; the eighth very dark brown partly shaded with yellow; fringe yellow at base, white outwardly. Secondaries whitish with traces of subterminal grayish lines; base of fringe pale yellow. Expanse, 33 mm.

Habitat: Castro, Parana.

Costria striolata.

Head and thorax white mottled with a few buff scales. Abdomen buff; white subdorsally at base. Primaries white, shaded with pale brown on the costa, in the cell, and below vein 1b; the fringe on inner margin white; beyond the cell long fine brownish lines not reaching apex or outer margin; basal half of costal margin finely dark gray; an outwardly oblique brownish shade from before the middle of costal margin, terminating in two dark brown spots and below margin vein 1c; a brown spot on outer margin at vein 3; some subapical brown shadings; terminal brown and gray shadings. Secondaries pale reddish brown; the costa and inner margin whitish. Expanse, 30 mm.

Habitat: São Paulo, Brazil.

Costria arpi.

Head and thorax white irrorated with a few black scales. Primaries gray shaded with brown along costa, and on outer third of wing; some irregular transverse black striae, chiefly on outer half of wing; a thicker transverse black streak in the cell; a velvety black spot between veins 1b and 1c at a third from base; and a smaller spot below it nearer the base; a subterminal outwardly curved black line from veins 2-8 connected with fringe at vein 4 by a black bar, above which it is outwardly shaded with dark brown; the marginal space above vein 4 to costa before apex is otherwise pale brown; a dark costal spot before apex; fringe reddish brown. Secondaries dull grayish brown. Expanse, 46 mm.

Habitat: Rio Janeiro. In this species veins 6 and 7 on secondaries are from a point.

Costria elegans.

Palpi brown. Head whitish; vertex dark brown. Thorax dark brown; patagiae buff. Abdomen light brown. Primaries whitish buff, shaded with light brown; black and brown striae evenly distributed over the surface; costa, except at base and outer third, dark brown; the outer margin occupied by a large dark space, inwardly curved and limited by a dark velvety brown shade; the space contiguous to this toward the base is without striae and appears like a pale line; the space within the curved brown line and a terminal dark brown line is dark olivaceous above vein 5, and lilacine white below it; a small dark brown spot on the lilacine portion; fringe pale brown. Secondaries and base of fringe pale brown; the fringe terminally white. Expanse, 25 mm.

Habitat: Castro, Parana.

Costria discopuncta.

Body yellowish white. Primaries white; a large velvety black spot in the cell; a very small spot on vein 1c, and another below vein 1b; the spots oblique, the lowest being nearest the base; the costal margin narrowly dark gray; the outer margin and posterior outer half of wing striated with brown and gray; fringe light brown. Secondaries white; a fine terminal shade, and base of fringe yellowish; a small brownish shade near anal angle. Expanse, 33 mm.

Habitat: São Paulo, Brazil. *Præclara* (*Cossula*) Schs. also belongs to this genus. (P. Z. S. Lond., 1892, p. 328). *Arbela norax*, Druce, differs from *Cossula* and *Costria* in having veins 7 and 8 on primaries stalked. The other species described by Druce under *Arbela*, I have not been able to examine.

Givira Walk.

Antennæ pectinated. Palpi extending beyond frons. Primaries: veins 1b and 1c connected by a bar; 2 and 3 far apart; 5 near 4; 6 from upper angle of cell, 7 and 8 stalked from areole; 9 from areole, 10 and 11 from cell. Secondaries 6 and 7 from cell. Type *Givira tristis* Walk.

Group I. Vein 8 connected with 7 by a bar:

tristis Walk.

macrochir Schs. (*Dolecta*).

subvenusta Sch. (*Dolecta*).

polybioides Schs., sp. nov.

platea Schs., sp. nov.

watsoni Schs., sp. nov.

Group II. Vein 8 free:

polybia Schs. (*Langsdorfia*).

Group III. Veins 7 and 8 on primaries from areole.

Secondaries: 8 connected to 7 by a bar:

Dukinfieldia Schs. (*Langsdorfia*).

Givira polybioides.

Body dark brownish gray. Primaries white; the costa, inner margin, cell, and median space below cell, brownish; costa spotted with black; some thick, black striæ on inner margin, and in cell; dark basal, and inner black line crossing the inner white space below cell; an outer broken, brown line; a subterminal black line, preceded by a brown spot between veins 5-8, and broken at veins 3 and 5, also connected to fringe at tips of veins by dark lines; a fine terminal brownish line, and intervenal terminal light brown spots. Secondaries white with irregular marginal brown marks. Fringe on both wings whitish, spotted with dark brown. Expanse, 34 mm.

Habitat: Castro, Parana. Veins 6 and 7 on secondaries apart. This species is allied to *G. polybia* Schs. (*Langsdorfia*), which has dark secondaries and veins 6 and 7 from a point.